

Historic, Archive Document

Do not assume content reflects current scientific knowledge, policies, or practices.



U. S. DEPT. OF AGRICULTURE
NATIONAL AND CULTURAL LIBRARY

JUN 2 - 1965

CURRENT SERIAL RECORDS

WATER SUPPLY OUTLOOK and **FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS** for **ARIZONA**

UNITED STATES DEPARTMENT of AGRICULTURE...SOIL CONSERVATION SERVICE,
SALT RIVER VALLEY WATER USERS ASSOCIATION
and
ARIZONA AGRICULTURAL EXPERIMENT STATION

Data included in this report were obtained by the agencies
named above in cooperation with the Federal, State and pri-
vate organizations listed on the last page of this report.

AS OF
APR. 1, 1965

UNITED STATES DEPARTMENT OF AGRICULTURE - SOIL CONSERVATION SERVICE

To Recipients of Water Supply Outlook Reports:

The climate of the cultivated and populated areas of the West is characterized by relatively dry summer months. Such precipitation as occurs falls mostly in the winter and early spring months when it is of little immediate benefit to growing crops. Most of this precipitation falls as mountain snow which stays on the ground for months, melting later to sustain streamflow during the period of greatest demand during late spring and summer. Thus, nature provides in mountain snow an imposing water storage facility.

The amount of water stored in mountain snow varies from place to place as well as from year to year and accordingly, so does the runoff of the streams. The best seasonal management of variable western water supplies results from advance estimates of the streamflow.

A snow survey consists of a series of about ten samples taken with specially designed snow sampling equipment along a permanently marked line, up to 1000 feet in length, called a snow course. The use of snow sampling equipment provides snow depth and water equivalent values for each sampling point. The average of these values is reported as the snow survey measurement for a snow course.

Snow surveys are made monthly or semi-monthly beginning in January or February and continue through the snow season until April, May or June. Currently more than 1400 western snow courses are measured each year. These measurements furnish the key data for water supply forecasts.

Streamflow forecasts are obtained by a comparison of total or maximum snow accumulation, as measured by snow water equivalent, to the subsequent spring and summer or snowmelt season runoff over a period of years. The snow water equivalent measured in selected snow courses provides most of the index to the streamflow forecast for the following season. More accurate forecasts are usually obtained when other factors such as soil moisture, base flow and spring precipitation are considered and included in the forecast procedure. Early season forecasts assume average climatic conditions through the snowmelt season.

Listed below are the Federal-State-Private Cooperative Snow Survey and Water Supply Forecast reports available for the West which contain detailed information on snow survey measurements, streamflow forecasts, reservoir storage, soil moisture and other guide data to water management and conservation decisions. Soil Conservation Service Reports may be secured from Soil Conservation Service, 511 N.W. Broadway - Room 507, Portland, Oregon 97209.

PUBLISHED BY SOIL CONSERVATION SERVICE

<u>REPORTS</u>	<u>ISSUED</u>	<u>LOCATION</u>	<u>COOPERATING WITH</u>
RIVER BASINS			
WESTERN UNITED STATES _____	MONTHLY (FEB.-MAY) _____	PORTLAND, OREGON _____	ALL COOPERATORS
BASIC DATA SUMMARY _____	OCTOBER 1 _____	PORTLAND, OREGON _____	ALL COOPERATORS
STATES			
ALASKA _____	MONTHLY (MAR.-MAY) _____	PALMER, ALASKA _____	ALASKA S.C.D.
ARIZONA _____	SEMI-MONTHLY _____ (JAN.15 - APR.1)	PHOENIX, ARIZONA _____	SALT R. VALLEY WATER USERS ASSOC. ARIZ. AGR. EXP. STATION
COLORADO AND NEW MEXICO _____	MONTHLY (FEB.-MAY) _____	FORT COLLINS, COLORADO _____	COLO. STATE UNIVERSITY COLO. STATE ENGINEER N. MEX. STATE ENGINEER
IDAHO _____	MONTHLY (JAN.-JUNE) _____	BOISE, IDAHO _____	IDAHO STATE RECLAMATION ENGINEER
MONTANA _____	MONTHLY (JAN.-JUNE) _____	BOZEMAN, MONTANA _____	MONT. AGR. EXP. STATION
NEVADA _____	MONTHLY (JAN.-MAY) _____	RENO, NEVADA _____	NEVADA DEPT. OF CONSERVATION AND NATURAL RESOURCES - DIVISION OF WATER RESOURCES
OREGON _____	MONTHLY (JAN.-JUNE) _____	PORTLAND, OREGON _____	OREG. STATE UNIVERSITY OREGON STATE ENGINEER
UTAH _____	MONTHLY (JAN.-JUNE) _____	SALT LAKE CITY, UTAH _____	UTAH STATE ENGINEER
WASHINGTON _____	MONTHLY (FEB.-JUNE) _____	SPOKANE, WASHINGTON _____	WN. STATE DEPT. OF CONSERVATION
WYOMING _____	MONTHLY (FEB.-JUNE) _____	CASPER, WYOMING _____	WYOMING STATE ENGINEER

PUBLISHED BY OTHER AGENCIES

<u>REPORTS</u>	<u>ISSUED</u>	<u>AGENCY</u>
BRITISH COLUMBIA _____	MONTHLY (FEB.-JUNE) _____	WATER RESOURCES SERVICE, DEPT. OF LANDS, FOREST AND WATER RESOURCES, PARLIAMENT BLDG., VICTORIA, B.C., CANADA
CALIFORNIA _____	MONTHLY (FEB.-MAY) _____	CALIF. DEPT. OF WATER RESOURCES, P.O. Box 388, SACRAMENTO, CALIF.

WATER SUPPLY OUTLOOK
and
FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS
for
ARIZONA

(Salt, Verde, Gila and Part of Lower Colorado River Basin)

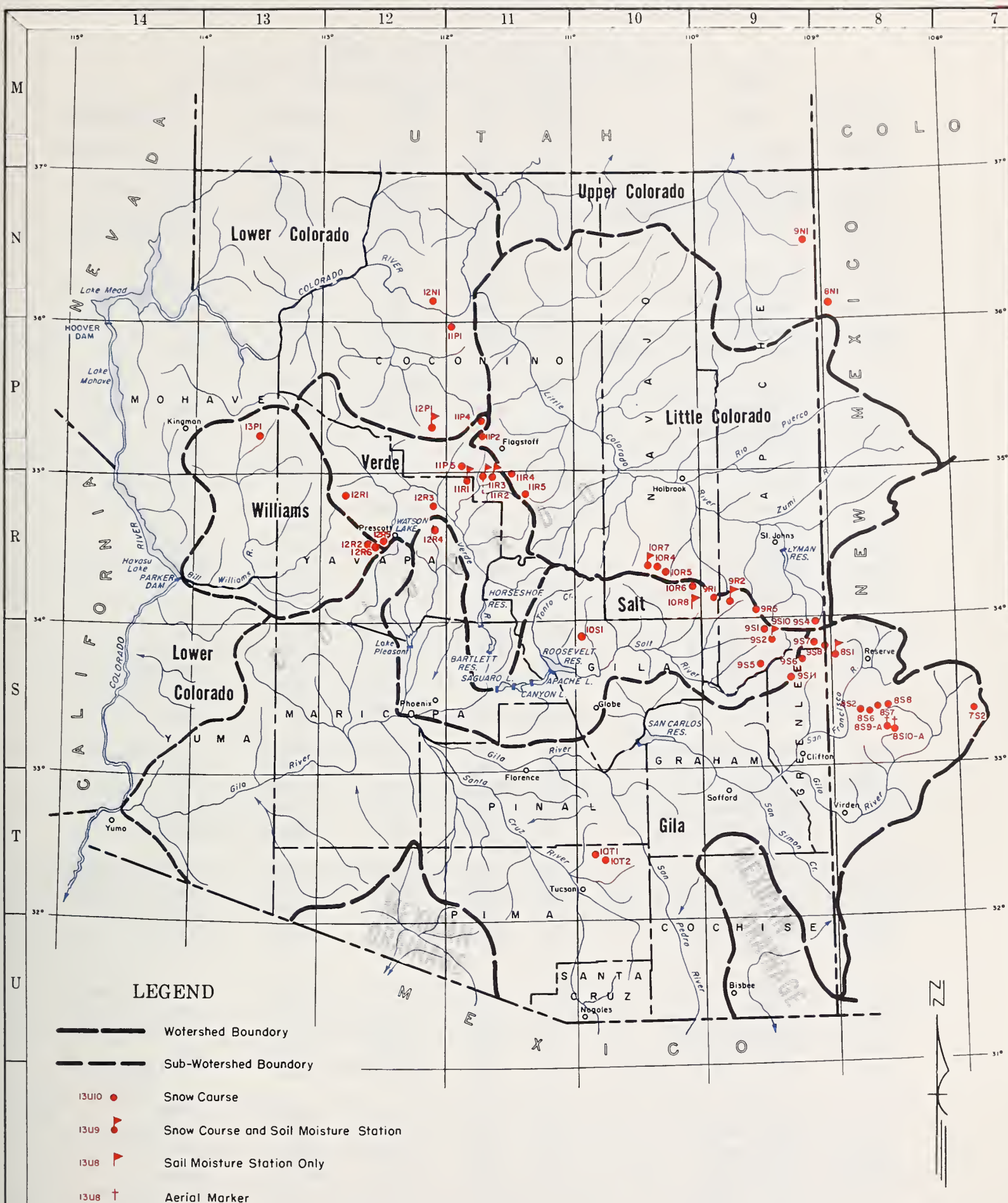
Report prepared by

RICHARD W. ENZ...SNOW SURVEY SUPERVISOR
SOIL CONSERVATION SERVICE
ROOM 6029 FEDERAL BUILDING
PHOENIX, ARIZONA 85025

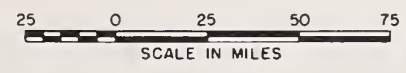
Issued by

ROBERT V. BOYLE
STATE CONSERVATIONIST
SOIL CONSERVATION SERVICE

VICTOR I. CORBELL
PRESIDENT
SALT RIVER VALLEY WATER USERS ASSOCIATION



ARIZONA COOPERATIVE SNOW SURVEYS Snow Courses and Sub-Watersheds



INDEX to SNOW COURSES and SOIL MOISTURE STATIONS

Number**	Name	Sec	Twp	Rge***	Elevation	River Basin
9S1	Baldy (p)	28	7N	27E	9125	Little Colorado
10T1	Bear Wallow	6	12S	16E	8100	Gila
9S6	Beaver Head	13	4N	30E	8000	San Francisco
9S10-*	Black River Divide	10	6N	27E	9400	Salt
12N1	Bright Angel	34	33N	3E	8400	Lower Colorado
12R1	Camp Wood	3	16N	6W	5700	Verde
10R7-M	Canyon Creek #2	18	11N	15E	7500	Little Colorado
11R2-M	Casner Park	19	18N	8E	6930	Verde
12P1-M	Chalender	27	22N	3E	7100	Verde
12R6	Copper Basin Divide(p)	23	13N	3W	6720	Verde
10R8 -*	Corduroy Creek	4	8N	21E	6000	Salt
9S7	Coronado Trail	26	5N	30E	8000	San Francisco
10R6	Forest Dale	2	9N	21E	6430	Salt
11P2	Fort Valley (p)	22	22N	6E	7350	Little Colorado
9R5	Ft. Apache	18	7N	27E	9160	Little Colorado
8S1-M	Frisco Divide	31	6S	20W****	8000	San Francisco
12R4	Gaddes Canyon	11	15N	2E	7600	Verde
10R5	Gentry	36	11N	15E	7650	Salt
11P1	Grand Canyon	21	30N	4E	7500	Lower Colorado
9S11	Hannagan Meadows (p)	19	3N	29E	9090	Salt
11R5	Happy Jack	30	17N	9E	7630	Verde
10R4	Heber (p)	28	11N	15E	7600	Little Colorado
8S9-A	Hummingbird	19	11S	17E	10550	San Francisco
8S6	Ice King	6	11S	18W****	8020	San Francisco
7S2	Inman	6	11S	10W****	7800	Gila
12R2	Iron Springs	22	14N	3W	6200	Bill Williams
9S2	Maverick Fork (p)	13	6N	27E	9150	Salt
9R2-M	McNary	23	8N	23E	7200	Salt
9R1	Milk Ranch	33	8N	23E	7000	Salt
12R3	Mingus Mountain	3	15N	2E	7100	Verde
8S2	Mogollon	2	11S	19W****	7000	San Francisco
11R4	Mormon Lake	13	18N	8E	7350	Little Colorado
11R3-M	Mormon Mountain (p)	14	18N	8E	7500	Verde
11R1-M	Munds Park	7	18N	7E	6500	Verde
11P5-M	Newman Park	25	19N	6E	6750	Verde
9S4	Nutriso	23	6N	30E	8500	San Francisco
9S5	Pacheta	27	4-1/2N	27E	7800	Salt
8S7	Redstone Trail	5	11S	18W****	8600	San Francisco
10T2	Rose Canyon	15	12S	16E	7300	Gila
8S8	Silver Creek Divide	4	11S	18W****	9000	San Francisco
11P4	Snow Bowl (p)	36	23N	6E	10260	Verde
9S8	State Line	6	6S	21W****	8000	San Francisco
12R5	White Spar	19	13N	2W	6000	Verde
8S10-A	Whitewater	19	11S	17E	10750	Gila
13P1	Willow Ranch	16	21N	11W	5000	Bill Williams
10S1	Workman Creek	33	6N	14E	6900	Salt

* SOIL MOISTURE STATION ONLY

** NUMBER INDICATES LOCATION OF SNOW COURSE WITHIN COORDINATE RECTANGLE.
THUS 9N1 IS COURSE #1 IN COORDINATE RECTANGLE 9N.

*** ALL IN GILA AND SALT RIVER BASE AND MERIDIAN EXCEPT WHERE OTHERWISE
INDICATED.

**** NEW MEXICO PRINCIPAL MERIDIAN

M SOIL MOISTURE STATION INSTALLED ON OR IN VICINITY OF SNOW COURSE.

(p) STORAGE GAGE INSTALLED ON OR IN VICINITY OF SNOW COURSE.

A AERIAL SNOW DEPTH GAGE

ARIZONA WATER SUPPLY OUTLOOK

APRIL 1, 1965

* * * * *
* The Water Supply Outlook for Arizona is good. Reservoir *
* Storage is generally high with good runoff still expected. *
* Slightly below average water supplies, however, are *
* anticipated on the Gila River. *
* * * * *

SNOW COVER: Snow cover is still above average on all watersheds except the Verde. Storms since April 1, however, have probably raised the snow cover on the Verde Watershed above average too. Warm temperatures the latter part of March have melted much of the snow at the low and intermediate elevations. In the White Mountains the snow pack is 40% above average, due mainly to the deep snow above 9000' elevation. Near normal snow exists on the Gila Watershed; although the deepest snow measured (76") is present on Whitewater Baldy at elevation 10,750'.

PRECIPITATION: Much above average precipitation was received on the Verde Watershed during March. Heaviest amounts occurred on Mormon Mountain and Copper Basin Divide, where 5.65" and 4.69" was received respectively. On the other Watersheds in the state, precipitation was generally below average. Accumulated precipitation since November 1, ranges from 116% of average at Hannagan Meadows, to 140% at Happy Jack.

The storm presently in progress promises to continue this wet trend, especially on the Verde Watershed.

SOIL MOISTURE: Soil moisture is good everywhere, but exceptionally high on the Verde Watershed which has been receiving more storms. Driest conditions exist on the Gila Watershed.

RESERVOIR STORAGE: Good runoff during March has raised the storage in the Salt River Project Reservoirs to 1,123,000 Acre Feet. This is 123% of the 1948-62 15-year average, and 54% of capacity. Only San Carlos Reservoir contains below average storage.

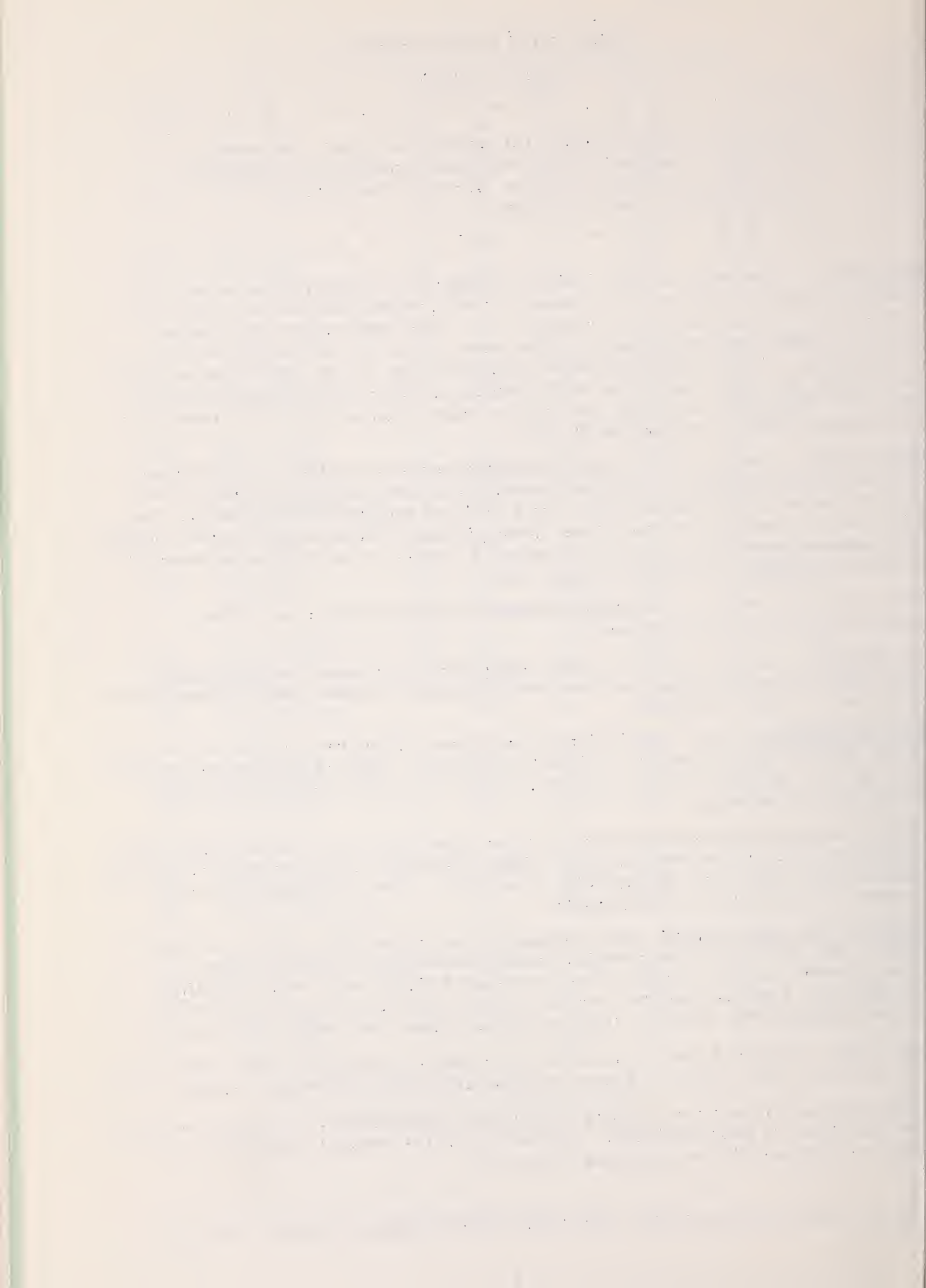
Watson Lake near Prescott is full for the first time since 1958. Most small lakes are full in northern Arizona. Lyman Reservoir contains 151% of average stored water, but this is only 42% of capacity. The anticipated runoff, however, will increase this greatly.

STREAMFLOW AND WATER SUPPLY: The combined flow of the Salt, Verde, and Tonto Rivers, was 138% of average during March, producing 228,300 Acre Feet. Since January 1, these streams have produced 622,000 Acre Feet; another 294,000 Acre Feet is forecast, making a total of 916,000 Acre Feet for the January through May period. This is 65% more than the 1948-62 average.

The Little Colorado River is forecast to produce 14,000 Acre Feet, just twice the average; while the Gila River is expected to flow 18% below average.

Efficient use of water by farmers will permit considerable carry-over storage for next year on most projects. On the San Carlos Project, however, substantial pumping will be required this year.

THIS IS THE FINAL SNOW SURVEY AND WATER SUPPLY FORECAST BULLETIN FOR 1965.



STREAM FLOW FORECASTS - APRIL 1, 1965

The following summarized runoff forecasts are based principally on mountain snow cover and on the assumption that precipitation and temperature will be near average from the present time to the end of the forecast period. Appreciable deviations from normal of temperature and/or precipitation will correspondingly modify these forecasts.

SUB-WATERSHED, STREAM and STATION	SEASONAL STREAM FLOW IN THOUSANDS OF ACRE FEET					
	FORECAST PERIOD: APRIL - MAY, INCLUSIVE					
	Forecast Runoff 1965	Percent 15-Year Average	Measured Runoff			1948-62 Average
			1964	1963	1961	
Salt River at Intake	210	146	79.7	71.9	311.1	144.2
Tonto River above Roosevelt	12	148	6.7	1.7	9.7	8.1
Verde River above Horseshoe	72	150	71.1	16.2	57.7	48.0
Gila River near Gila	18	95	8.3	15.0	36.1	19.0
Gila River near Virden	18	90	6.0	15.4	46.8	20.1
Gila River near Solomon	32	82	10.6	27.9	87.2	39.0
Frisko River near Glenwood	73	77	---	4.6	21.3	9.5
Frisko River at Clifton	16	76	6.8	15.2	42.2	21.1
Little Colorado River above Lyman Dam (APR.-JUNE, INCL.)	14	194	3.7	1.0	22.2	7.2

Granite Creek is forecast to flow 600 Acre Feet during April and May.

1965

TOTAL WINTER AND SPRING RUNOFF

STREAM and STATION	Measured Runoff Jan. -Mar.	Forecast Runoff Apr. -May	<u>January thru May, Inclusive</u>		
			1965	15-Year Average	% of Average
Salt River at Intake	293.5	210	503.5	319.1	158
Verde River above Horseshoe	242.1	72	314.1	185.8	169
Tonto River above Roosevelt	86.1	12	98.1	50.9	193
Gila River nr. Virden	35.2	18	53.2	67.8	78
Gila River nr. Solomon	69.8	32	101.8	135.3	75
Frisco River at Clifton	34.5	16	50.5	68.7	74
Little Colorado River above Lyman Dam (Jan.thru June, Incl.)	4.8	14	18.8	9.8	194



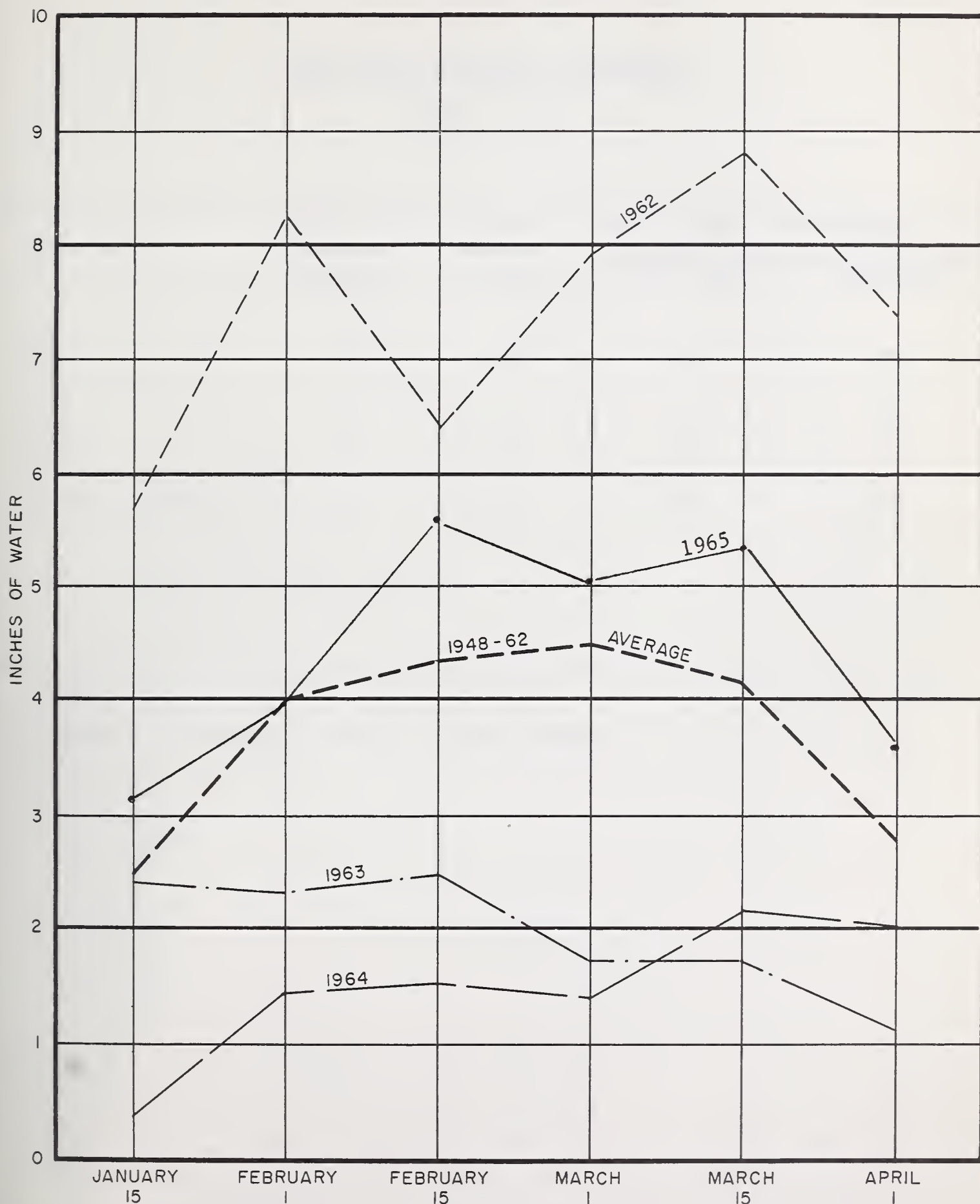
STATUS OF ARIZONA RESERVOIR STORAGE - ABOUT APRIL 1, 1965

SUB- WATERSHED and/or STREAM	RESERVOIR	USABLE CAPACITY 1000s		USABLE STORAGE - 1000s ACRE FEET			15-Year Average 1948-62
		AC.	FT.	1965	1964	1963	
<u>GILA RIVER SUB-WATERSHED</u>							
Agua Fria	Lake Pleasant	163.8		37.3	17.5	2.8	33.9
Granite	Watson Lake	4.7		4.7	4.0	0.7	---
Gila	San Carlos	1,206.0		76.6	51.6	120.8	84.0
Verde	Bartlett	179.5		122.2	27.5	30.0	79.8
Verde	Horseshoe	142.8		50.8	5.6	1.3	41.3
Salt	Roosevelt	1,382.0		591.3	358.2	669.3	477.3
Salt	Apache	245.0		239.4	240.5	230.8	211.2
Salt	Canyon	58.0		53.9	55.4	52.0	50.1
Salt	Saguaro	70.0		65.4	65.7	65.9	55.4
<u>LOWER COLORADO RIVER SUB-WATERSHED</u>							
Colorado	Lake Havasu	619.4		533.7	548.6	556.0	562.8
Colorado	Lake Mohave	1,810.0		1,663.3	1,663.0	1,703.0	1,564.3*
Colorado	Lake Mead	27,207.0		11,151.0	14,609.0	21,867.0	16,604.2
Little Colo.	Lyman	30.6		12.7	10.9	14.0	8.4
Little Colo.	Show Low Lake	5.1		4.9	0.7	1.4	2.2*
<u>UPPER COLORADO RIVER SUB-WATERSHED</u>							
Colorado	Lake Powell	25,002.0		6,221.8	2,977.0	273.8	---

* Average is for less than 15 years of record in the 1948-62 period.

RELATIVE SNOW WATER ACCUMULATION ARIZONA

APRIL 1, 1965



This graph represents the average snow water content on eleven selected snow courses on Arizona Sub-Watersheds.

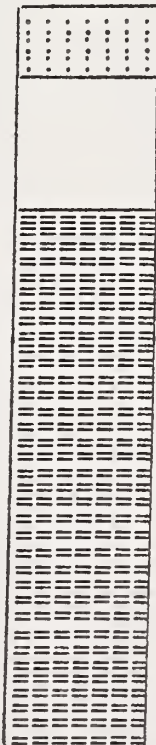
SNOW COVER ON ARIZONA WATERSHEDS

APRIL 1, 1965

Watershed	No. of Courses Average	Water Content of Snow	This Year's Water Content of Snow Expressed as Percent of:	
			Last Year	Average *
Gila	8	1.5	249	108
Salt	14	2.9	171	128
Verde	11	1.8	90	92
Little Colorado	5	4.1	269	140

* Actual or Estimated 1948-62, 15-year Average.

APRIL 1, 1965



* Based on present Storage + Forecast Spring runoff + Average Summer runoff.

SNOW ABOUT APRIL 1, 1965

DRAINAGE BASIN and SNOW COURSE			CURRENT INFORMATION			PAST RECORD	
			DATE OF SURVEY	SNOW DEPTH (Inches)	WATER CONTENT (Inches)	WATER CONTENT (Inches)	
NAME	NO.	ELEVATION				LAST YEAR	AVERAGE ^a

GILA RIVER

Bear Wallow	10T1	8100	3/29	10	3.4	0.6	1.8
Beaver Head	9S6	8000	3/30	2	0.6	0.7	1.2
Coronado Trail	9S7	8000	3/31	1	0.5	0.0	1.1
Frisco Divide	8S1-M	8000	3/31	1	0.7	T	0.7
Hummingbird #2 (A)	8S9-A	10550	3/31	57	21.1	---	---
Ice King	8S6	8020	3/31	22	7.8	3.4	---
Inman	7S2	7800	3/31	0	0.0	0.0	0.0
Mogollon	8S2	7000	3/31	0	0.0	0.0	0.3 **
Nutrioso	9S4	8500	3/31	3	1.1	0.0	0.6
Redstone Trail	8S7	8600	3/31	26	9.3	4.2	---
Rose Canyon	10T2	7300	3/29	0	0.0	0.0	0.6
Silver Creek Divide	8S8	9000	3/31	38	13.5	5.5	---
State Line	9S8	8000	3/31	0	0.0	0.0	0.4
Whitewater (A)	8S10-A	10750	3/31	76	24.3	10.0	---

SALT RIVER

Baldy *	9S1	9125	3/31	27	9.6	4.1	6.1 **
Beaver Head	9S6	8000	3/30	2	0.6	0.7	1.2
Canyon Creek #2	10R7-M	7500	3/30	3	1.1	2.6	1.1 **
Coronado Trail	9S7	8000	3/31	1	0.5	0.0	1.1
Forest Dale	10R6	6430	3/31	0	0.0	0.0	0.0
Ft. Apache *	9R5	9160	3/31	28	9.4	4.0	7.6 **
Gentry	10R5	7600	3/30	T	T	1.4	1.0 **
Hannagan Meadows	9S11	9090	3/30	33	10.9	4.5	---
Heber	10R4	7600	3/30	3	1.1	2.2	1.3 **
Maverick Fork	9S2	9050	-- No Survey	----	----	4.8	8.2 **
McNary	9R2-M	7200	3/31	1	0.5	0.0	0.4
Milk Ranch	9R1	7000	3/31	0	0.0	0.0	0.0
Nutrioso *	9S4	8500	3/31	3	1.1	0.0	0.6
Pacheta	9S5	7800	3/30	0	0.0	0.0	1.0 **
Workman Creek	10S1	6900	3/31	0	0.0	4.1	2.2 **

VERDE RIVER

Camp Wood	12R1	5700	3/29	0	0.0	1.3	0.0
Casner Park	11R2-M	6930	3/29	T	T	3.7	1.7 **
Chalender	12P1-M	7100	3/31	3	2.7	1.6	1.5
Copper Basin Divide	12R6	6720	3/31	0	0.0	0.0	---
Fort Valley	11P2	7350	3/30	0	0.0	0.0	1.4
Gaddes Canyon	12R4	7600	3/31	24	7.5	1.2	5.2 **
Happy Jack	11R5	7630	3/30	3	1.1	2.6	2.6 **
Iron Springs *	12R2	6200	3/31	0	0.0	0.0	0.0
Mingus Mountain	12R3	7100	3/31	0	0.0	0.0	0.1
Mormon Lake *	11R4	7350	3/29	7	3.0	4.6	3.3
Mormon Mountain	11R3-M	7500	3/29	14	5.7	4.8	4.9 **
Munds Park	11R1-M	6500	3/29	T	T	2.3	1.1 **
Newman Park	11P5-M	6750	3/29	T	T	2.2	---
Snow Bowl #1	11P4	10260	Report Delayed			6.5	---
Snow Bowl #2	11P6	11000	Report Delayed			---	---
White Spar	12R5	6000	3/31	0	0.0	0.0	---

(a) 1948-62, 15 year period. (*) Adjacent drainage. (**) 1948-62 Adjusted Average. (A) Aerial observation: Water content estimated.

SNOW ABOUT APRIL 1, 1965

DRAINAGE BASIN and SNOW COURSE			CURRENT INFORMATION			PAST RECORD	
NAME	NO.	ELEVATION	DATE OF SURVEY	SNOW DEPTH (Inches)	WATER CONTENT (Inches)	WATER CONTENT (Inches)	
						LAST YEAR	AVERAGE ^a

BILL WILLIAMS RIVER

Camp Wood *	12R1	5700	3/29	0	0.0	1.3	0.0
Copper Basin Divide	12R6	6720	3/31	0	0.0	0.0	---
Iron Springs	12R2	6200	3/31	0	0.0	0.0	0.0
Willow Ranch	13P1	5000	3/30	0	0.0	0.0	0.0

LOWER COLORADO RIVER

Bright Angel	12N1	8400	3/31	34	10.8	---	9.3 **
Chalender *	12P1-M	7100	3/31	3	2.7	1.6	1.5
Fort Valley	11P2	7350	3/30	0	0.0	0.0	1.4
Grand Canyon	11P1	7500	3/31	0	0.0	0.0	1.1

LITTLE COLORADO RIVER

Baldy	9S1	9125	3/31	27	9.6	4.1	6.1 **
Canyon Creek #2	10R7-M	7500	3/30	3	1.1	2.6	1.1 **
Forest Dale	10R6	6430	3/31	0	0.0	0.0	0.0
Ft. Apache	9R5	9160	3/31	28	9.4	4.0	7.6 **
Fort Valley	11P2	7350	3/30	0	0.0	0.0	1.4
Gentry	10R5	7600	3/30	T	T	1.4	1.0 **
Happy Jack *	11R5	7630	3/30	3	1.1	2.6	2.6 **
Heber	10R4	7600	3/30	3	1.1	2.2	1.3 **
McNary	9R2-M	7200	3/31	1	0.5	0.0	0.4
Mormon Lake	11R4	7350	3/29	7	3.0	4.6	3.3
Mormon Mountain	11R3-M	7500	3/29	14	5.7	4.8	4.9 **
Nutriosio	9S4	8500	3/31	3	1.1	0.0	0.6
Snow Bowl #1	11P4	10260	Report Delayed			6.5	---
Snow Bowl #2	11P6	11000	Report Delayed			--	---

(a) 1948-62, 15 year period. (*) Adjacent drainage. (**) 1948-62 Adjusted Average. (A) Aerial observation: Water content estimated.

Table 1: Summary of Data

1	2	3	4	5	6	7
10	20	30	40	50	60	70
80	90	100	110	120	130	140
150	160	170	180	190	200	210

Table 2: Summary of Data

1	2	3	4	5	6	7
10	20	30	40	50	60	70
80	90	100	110	120	130	140
150	160	170	180	190	200	210

Table 3: Summary of Data

1	2	3	4	5	6	7
10	20	30	40	50	60	70
80	90	100	110	120	130	140
150	160	170	180	190	200	210

Table 4: Summary of Data

1	2	3	4	5	6	7
10	20	30	40	50	60	70
80	90	100	110	120	130	140
150	160	170	180	190	200	210

Table 5: Summary of Data

1	2	3	4	5	6	7
10	20	30	40	50	60	70
80	90	100	110	120	130	140
150	160	170	180	190	200	210

Table 6: Summary of Data

1	2	3	4	5	6	7
10	20	30	40	50	60	70
80	90	100	110	120	130	140
150	160	170	180	190	200	210

Table 7: Summary of Data

1	2	3	4	5	6	7
10	20	30	40	50	60	70
80	90	100	110	120	130	140
150	160	170	180	190	200	210

Table 8: Summary of Data

1	2	3	4	5	6	7
10	20	30	40	50	60	70
80	90	100	110	120	130	140
150	160	170	180	190	200	210

Table 9: Summary of Data

1	2	3	4	5	6	7
10	20	30	40	50	60	70
80	90	100	110	120	130	140
150	160	170	180	190	200	210

Table 10: Summary of Data

1	2	3	4	5	6	7
10	20	30	40	50	60	70
80	90	100	110	120	130	140
150	160	170	180	190	200	210

Table 11: Summary of Data

1	2	3	4	5	6	7
10	20	30	40	50	60	70
80	90	100	110	120	130	140
150	160	170	180	190	200	210

Table 12: Summary of Data

1	2	3	4	5	6	7
10	20	30	40	50	60	70
80	90	100	110	120	130	140
150	160	170	180	190	200	210

Table 13: Summary of Data

1	2	3	4	5	6	7
10	20	30	40	50	60	70
80	90	100	110	120	130	140
150	160	170	180	190	200	210

Table 14: Summary of Data

1	2	3	4	5	6	7
10	20	30	40	50	60	70
80	90	100	110	120	130	140
150	160	170	180	190	200	210

Table 15: Summary of Data

1	2	3	4	5	6	7
10	20	30	40	50	60	70
80	90	100	110	120	130	140
150	160	170	180	190	200	210

Table 16: Summary of Data

1	2	3	4	5	6	7
10	20	30	40	50	60	70
80	90	100	110	120	130	140
150	160	170	180	190	200	210

Table 17: Summary of Data

1	2	3	4	5	6	7
10	20	30	40	50	60	70
80	90	100	110	120	130	140
150	160	170	180	190	200	210

Table 18: Summary of Data

1	2	3	4	5	6	7
10	20	30	40	50	60	70
80	90	100	110	120	130	140
150	160	170	180	190	200	210

Table 19: Summary of Data

PRECIPITATION

STORAGE GAGE DATA - ABOUT APRIL 1, 1965

Drainage Basin and Storage Gage	Elev.	Current Data		1948-62	From Approx. 11/1 to Date		
		Date of Reading	March Precip.	Avg. Mar. Precip.	This Year	1948-62 Average	% of Average
<u>GILA RIVER</u>							
Silver Creek Divide	9000	3/31	2.05	--	15.86	--	---
Hannagan Meadows	9030	3/31	1.97	3.37*	16.14	13.90*	116
<u>SALT RIVER</u>							
Hannagan Meadows	9030	3/31	1.97	3.37*	16.14	13.90*	116
Little Wildcat (Heber Snow Course)	7600	3/30	3.12	3.20*	17.88#	14.17*	127
Maverick Fork	9050	3/31	1.50#	2.97	15.76#	12.18*	129
Workman Creek <u>1/</u>	6970.	3/31	4.10	3.66	20.54	17.20	119
<u>VERDE RIVER</u>							
Copper Basin Divide	6720	3/31	4.69	--	14.65	--	---
Fort Valley <u>1/</u>	7350	3/31	2.59	1.84	10.57	9.00	117
Happy Jack <u>1/</u>	7480	3/31	3.32	2.67*	16.60	11.82*	140
Mingus Mountain	7660	3/31	2.73	2.11	12.54	10.11	124
Mormon Mountain	7500	3/29	5.65	--	21.93	--	---
<u>LITTLE COLORADO</u>							
Sheep Crossing (Baldy Snow Course)	9125	3/31	1.40	2.53*	14.02	10.88*	129
Little Wildcat (Heber Snow Course)	7600	3/30	3.12	3.20*	17.88#	14.17*	127

1/ Data supplied by U. S. Forest Service

* 1948-62 Adjusted Average

Partially Estimated

ARIZONA SOIL MOISTURE - ABOUT APRIL 1, 1965

Drainage Basin and Station	<u>1/</u> Station Number	Elev.	Soil Profile in Inches		Soil Moisture Content in Inches				
			Depth	Cap.	Date	1965	Past Record		
							1964	1963	Avg.
<u>GILA RIVER</u>									
Frisco Divide	8S1-M	8000	48	13.3	3/31	11.8	6.9	11.8	11.7
<u>SALT RIVER</u>									
Black River Divide	9S10-*	9100	48	16.8	3/31	17.9	15.6	15.9	15.9
Canyon Creek #2	10R7-M	7500	48	18.3	3/30	14.7	14.5	13.8	14.5
Corduroy Creek	10R8-*	6000	48	16.0	3/30	12.2	7.1	11.0	9.7
McNary	9R2-M	7200	48	16.3	3/30	17.9	13.5	15.5	14.8
<u>VERDE RIVER</u>									
Casner Park	11R2-M	6930	48	19.1	3/29	21.0	15.8	19.7	17.0
Mormon Mountain	11R3-M	7500	48	16.1	3/29	17.7	15.6	17.8	16.2

1/* - Soil Moisture Station only
M - Snow Course and Soil Moisture Station

LIST OF SNOW SURVEYORS

<u>SNOW COURSE</u>	<u>SURVEYOR</u>
Baldy -----	SCS and SRVWUA
Bear Wallow -----	Forest Service - Allan Hinds
Beaver Head -----	N. A. Josh
Bright Angel -----	National Park Service - Vern Ruesch
Camp Wood -----	Lyn Pehl
Canyon Creek #2 -----	SCS and SRVWUA
Casner Park -----	SCS and SRVWUA
Chalender -----	Forest Service - Mel Richards
Copper Basin Divide -----	SCS - Bill Gray
Coronado Trail -----	Forest Service - Larry Soehlig
Forest Dale -----	Fort Apache Reservation - Raymond Endfield
Ft. Apache -----	SCS and SRVWUA
Fort Valley -----	Rocky Mountain Forest & Range Exp. Station
Frisco Divide -----	Forest Service - Joe Clayton
Gaddes Canyon -----	Paul G. Lidbeck
Gentry -----	SCS and SRVWUA
Grand Canyon -----	National Park Service - Larry Hackel
Hannagan Meadows -----	N. A. Josh
Happy Jack -----	Emil O. Ryberg
Heber -----	SCS and SRVWUA
Hummingbird -----	Ray Freeman
Ice King -----	James R. Wray
Inman -----	C. H. McCauley
Iron Springs -----	SCS - Bill Gray
Maverick Fork -----	SCS and SRVWUA
McNary -----	Fort Apache Reservation - Raymond Endfield
Milk Ranch -----	Fort Apache Reservation - Raymond Endfield
Mingus Mountain -----	Paul G. Lidbeck
Mogollon -----	James R. Wray
Mormon Lake -----	SCS and SRVWUA
Mormon Mountain -----	SCS and SRVWUA
Munds Park -----	SCS and SRVWUA
Newman Park -----	SCS and SRVWUA
Nutrioso -----	Forest Service - Larry Soehlig
Pacheta -----	Foch Phillips
Redstone Trail -----	James R. Wray
Rose Canyon -----	Forest Service - Allan Hinds
Silver Creek Divide -----	James R. Wray
Snow Bowl -----	Forest Service - Jay Shoemaker
State Line -----	Forest Service - Joe Clayton
White Spar -----	SCS - Bill Gray
Whitewater -----	Ray Freeman
Willow Ranch -----	Tiny Miller
Workman Creek -----	Rocky Mountain Forest & Range Exp. Station

The Following Organizations Cooperate in the Arizona Snow Survey Work

FEDERAL

Department of Agriculture

Soil Conservation Service

Forest Service

Apache Forest

Coconino Forest

Coronado Forest

Gila Forest

Kaibab Forest

Prescott Forest

Rocky Mountain Forest and Range Experiment Station

Tonto Forest

Department of Commerce

Weather Bureau

Arizona Section

Department of Interior

Bureau of Reclamation

Region III

Geological Survey

Arizona District

Bureau of Indian Affairs

Fort Apache Reservation

San Carlos Irrigation Project

National Park Service

Grand Canyon National Park

Gila Water Commissioner

Safford, Arizona

STATE

Arizona Agricultural Experiment Station

IRRIGATION PROJECTS

Salt River Valley Water Users' Association

Phoenix, Arizona

San Carlos Irrigation and Drainage District

Coolidge, Arizona

PRIVATE

Southwest Forest Industries, Inc.

McNary, Arizona

Other organizations and individuals furnish valuable information for the snow survey reports. Their cooperation is gratefully acknowledged.

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
ROOM 6029 FEDERAL BUILDING
PHOENIX, ARIZONA 85025

OFFICIAL BUSINESS

POSTAGE AND FEES PAID
U. S. DEPARTMENT OF AGRICULTURE

FIRST CLASS MAIL

FEDERAL - STATE - PRIVATE
COOPERATIVE SNOW SURVEYS

Furnishes the basic data
necessary for forecasting
water supply for irrigation,
domestic and municipal water
supply, hydro-electric power
generation, navigation,
mining and industry

*"The Conservation of Water begins
with the Snow Survey"*

196
3/5.m

WATER SUPPLY OUTLOOK and FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS for ARIZONA

(Salt, Verde, Gila and Part of Lower Colorado River Basin)

Report prepared by

RICHARD W. ENZ...SNOW SURVEY SUPERVISOR
SOIL CONSERVATION SERVICE
ROOM 6029 FEDERAL BUILDING
PHOENIX, ARIZONA 85025

U. S. DEPT. OF AGRICULTURE
NATIONAL AGRICULTURAL LIBRARY

MAY 11 1965

CURRENT SERIAL RECORDS

SPECIAL REPORT

APRIL 15, 1965

Issued by

ROBERT V. BOYLE
STATE CONSERVATIONIST
SOIL CONSERVATION SERVICE

VICTOR I. CORBELL
PRESIDENT
SALT RIVER VALLEY WATER USERS ASSOCIATION

AS CITY 11/12/12

RECEIVED 11/13/12

ARIZONA WATER SUPPLY OUTLOOK

APRIL 15, 1965

* * * * *
*
* The Water Supply Outlook for Arizona is very good except *
* for the San Carlos Project. Reservoir Storage on the *
* Salt River Project is 140% of average. Streamflow fore- *
* casts range from 75% of average on the Gila River, to *
* 580% of average on Tonto Creek. *
*
* * * * *

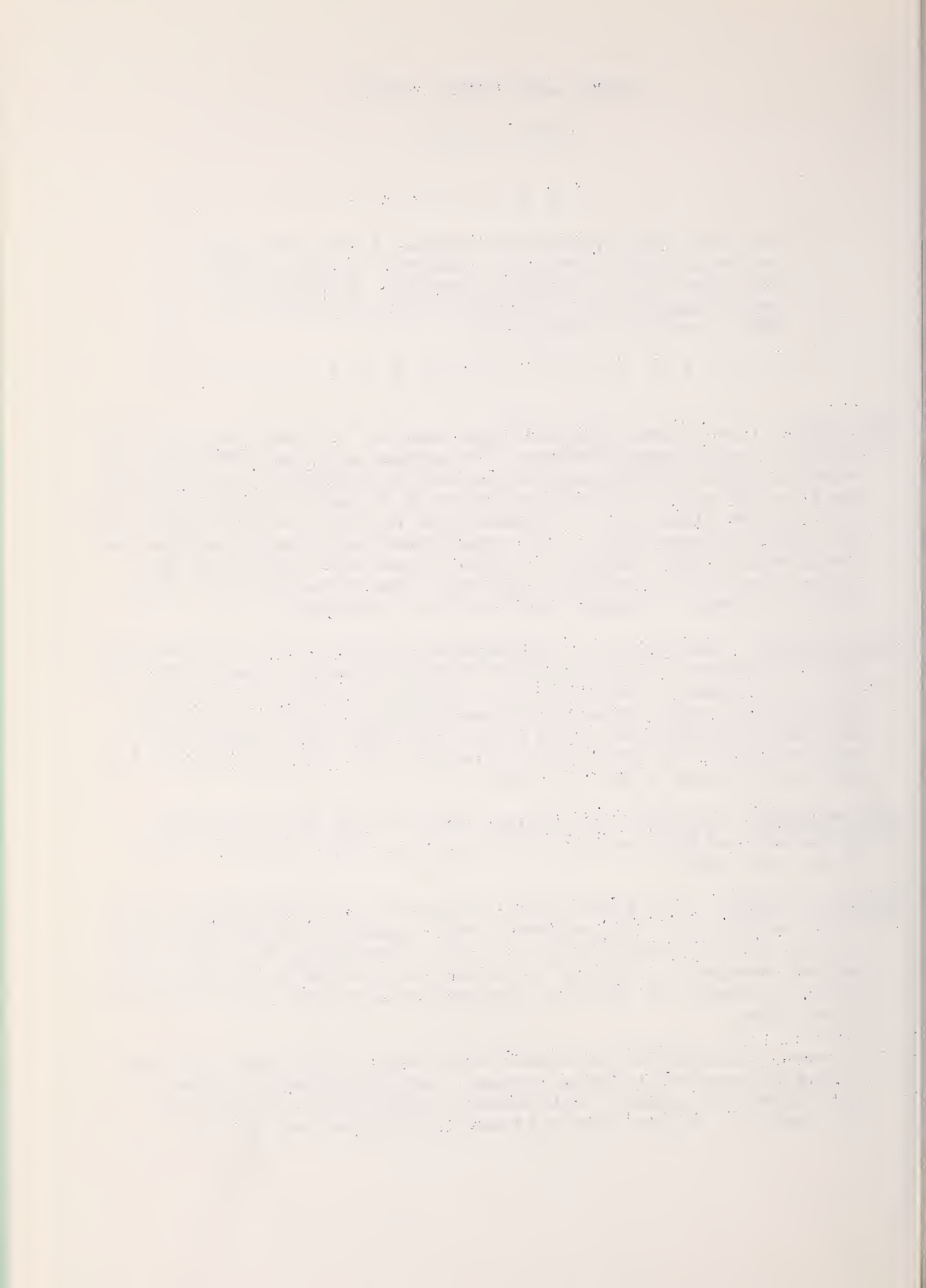
SNOW COVER: Heavy storms this month have resulted in record snow cover for April 15, on the Verde Watershed. The deepest snow ever officially surveyed in Arizona was measured at Snow Bowl #2 snow course, with 116" of depth and 32" of water. At Mormon Mountain the water content jumped from 5.7" to 10.8" since April 1. Elsewhere in the state the storms were of more moderate proportions. Cold temperatures have retarded melting, and consequently slight increases in water content were obtained at the higher elevations in the White Mountains. Low elevation snow courses reported no snow on the Gila and Salt River Watersheds.

PRECIPITATION: Since April 1, precipitation has been 3 to 7 times average. Heaviest reported precipitation was at Mormon Mountain, where 7.85" fell so far this month. Since November 1, this station has received 29.78". Flagstaff has already exceeded all past records for April, with 5.65". Some other Precipitation totals so far this month are: Payson 3.79", Workman Creek 3.75", McNary 3.40", Prescott 2.36", Hannagan Meadows 2.89" and Little Wildcat on the Rim 4.08".

SOIL MOISTURE: Excellent soil moisture exists on the Verde Watershed. On the Salt and Gila Watersheds it is good at higher elevations, but drying below 6000'.

RESERVOIR STORAGE: Salt River Project Reservoirs gained 200,000 Acre Feet so far during April. Streamflow has been tremendous on the Verde River raising storage to within 40,000 acre feet of capacity in Horseshoe and Bartlett Reservoirs. Filling to capacity is possible in the next week or so, but chances of spilling large quantities is not likely unless more storms occur.

Storage in Lake Pleasant increased 34,000 acre feet the last two weeks, raising its contents to twice average. San Carlos Reservoir shows no gain during this period. Most northern Arizona Lakes are spilling; only Lake Mary, Willow Lake, and Lyman Reservoir are not yet full.



ARIZONA WATER SUPPLY OUTLOOK - Cont'd

STREAMFLOW AND WATER SUPPLY: Combined flow of the Salt, Verde, and Tonto streams was 262,000 acre feet up to the 15th of April, with the Verde contributing 148,000 acre feet. An additional 62,000 acre feet is forecast on the Verde; 131,000 on the Salt; and 17,000 on Tonto Creek.

Total runoff on the Salt River Project Watershed, including what has occurred plus what is expected, comes to 1,095,000 acre feet for the period January through May. This is 197% of the 1948-62 15-year average.

With the anticipation of filling the Verde River Reservoirs, the Salt River Project is presently delivering free water at the rate of 5,000 acre feet per day. Farmers are urged to make use of this water if their fields are below field capacity. Over-irrigation however, should not be practiced, as water logging, poor aeration, and cooling of the seed bed, will have harmful effects on plant growth.

STREAM FLOW FORECASTS - APRIL 15, 1965

The following summarized runoff forecasts are based principally on mountain snow cover and on the assumption that precipitation and temperature will be near average from the present time to the end of the forecast period. Appreciable deviations from normal of temperature and/or precipitation will correspondingly modify these forecasts.

SUB-WATERSHED, STREAM and STATION	SEASONAL STREAM FLOW IN THOUSANDS OF ACRE FEET					
	FORECAST PERIOD: APRIL - MAY, INCLUSIVE					
	Forecast Runoff 1965	Percent 15-Year Average	Measured Runoff			1948-62 Average
			1964	1963	1962	
Salt River at Intake	215	149	79.7	71.9	311.1	144.2
Tonto River above Roosevelt	47	580	6.7	1.7	9.7	8.1
Verde River above Horseshoe	210	438	71.1	16.2	57.7	48.0
Gila River near Gila	15	79	8.3	15.0	36.1	19.0
Gila River near Virden	15	75	6.0	15.4	46.8	20.1
Gila River near Solomon	29	74	10.6	27.9	87.2	39.0
Frisco River near Glenwood	7	74	---	4.6	21.3	9.5
Frisco River at Clifton	16	76	6.8	15.2	42.2	21.1
Little Colorado River above Lyman Dam (APRIL-JUNE, INCL.)	14	194	3.7	1.0	22.2	7.2



STATUS OF ARIZONA RESERVOIR STORAGE - ABOUT APRIL 15, 1965

SUB- WATERSHED and/or STREAM	RESERVOIR	USABLE CAPACITY 1000s AC. FT.	USABLE STORAGE - 1000s ACRE FEET			
			1965	1964	1963	15-Year Average 1948-62
<u>GILA RIVER SUB-WATERSHED</u>						
Agua Fria	Lake Pleasant	163.8	71.0	17.6	2.7	33.9
Granite	Watson Lake	4.7	4.7	3.9	0.7	---
Gila	San Carlos	1,206.0	76.5	46.4	112.9	80.8
Verde	Bartlett	179.5	144.6	53.5	31.3	82.8
Verde	Horseshoe	142.8	127.7	20.7	1.1	37.9
Salt	Roosevelt	1,382.0	690.1	358.5	655.5	498.8
Salt	Apache	245.0	241.3	242.5	243.3	216.0
Salt	Canyon	58.0	54.2	54.5	56.1	50.7
Salt	Saguaro	70.0	66.5	67.5	58.0	55.4
<u>LOWER COLORADO RIVER SUB-WATERSHED</u>						
Colorado	Lake Havasu	619.4	524.7	564.0	584.6	611.0
Colorado	Lake Mohave	1,810.0	1,753.1	1,723.0	1,680.0	1,552.3*
Colorado	Lake Mead	27,207.0	11,350.0	14,582.0	21,486.0	16,523.0
Little Colo.	Lyman	30.6	15.7**	13.5**	13.6	10.2
Little Colo.	Show Low Lake	5.1	5.1	0.7	0.8**	2.6*
<u>UPPER COLORADO RIVER SUB-WATERSHED</u>						
Colorado	Lake Powell	28,040.0	6,197.8	---	---	---

* Average is for less than 15 years of record in the 1948-62 period.
 ** Estimated.



1965

TOTAL WINTER AND SPRING RUNOFF

STREAM and STATION	Measured Runoff Jan.-Mar.	Forecast Runoff Apr.-May	<u>January thru May, Inclusive</u>		
			1965	15-Year Average	% of Average
Salt River at Intake	296.3	215	511.0	319.1	160
Verde River above Horseshoe	204.2	210	450.0	185.8	242
Tonto River above Roosevelt	86.7	47	134.0	50.9	263
Gila River nr. Virden	35.2	15	50.0	67.8	75
Gila River nr. Solomon	69.8	29	99.0	135.3	73
Frisco River at Clifton	34.5	16	50.5	68.7	74
Little Colorado River above Lyman Dam (Jan.thru June, Incl.)	4.8	14	18.8	9.8	194

SNOW COVER ON ARIZONA WATERSHEDS *

APRIL 15, 1965

Watershed	% of April 1 -- 15 Yr. Average
Gila	88
Salt	158
Verde	211
Little Colorado	177

* Comparison is made to April 1, as Snow Surveys are not generally made on April 15, and consequently there is no average available.

Snow cover by April 15, is usually gone except above 8000'.

THE UNIVERSITY OF CHICAGO

LIBRARY

1950

1951

1952

1953

1954

1955

1956

1957

1958

1959

1960

1961

1962

1963

1964

1965

1966

1967

1968

1969

1970

1971

1972

1973

1974

1975

1976

1977

1978

1979

1980

1981

1982

1983

1984

1985

1986

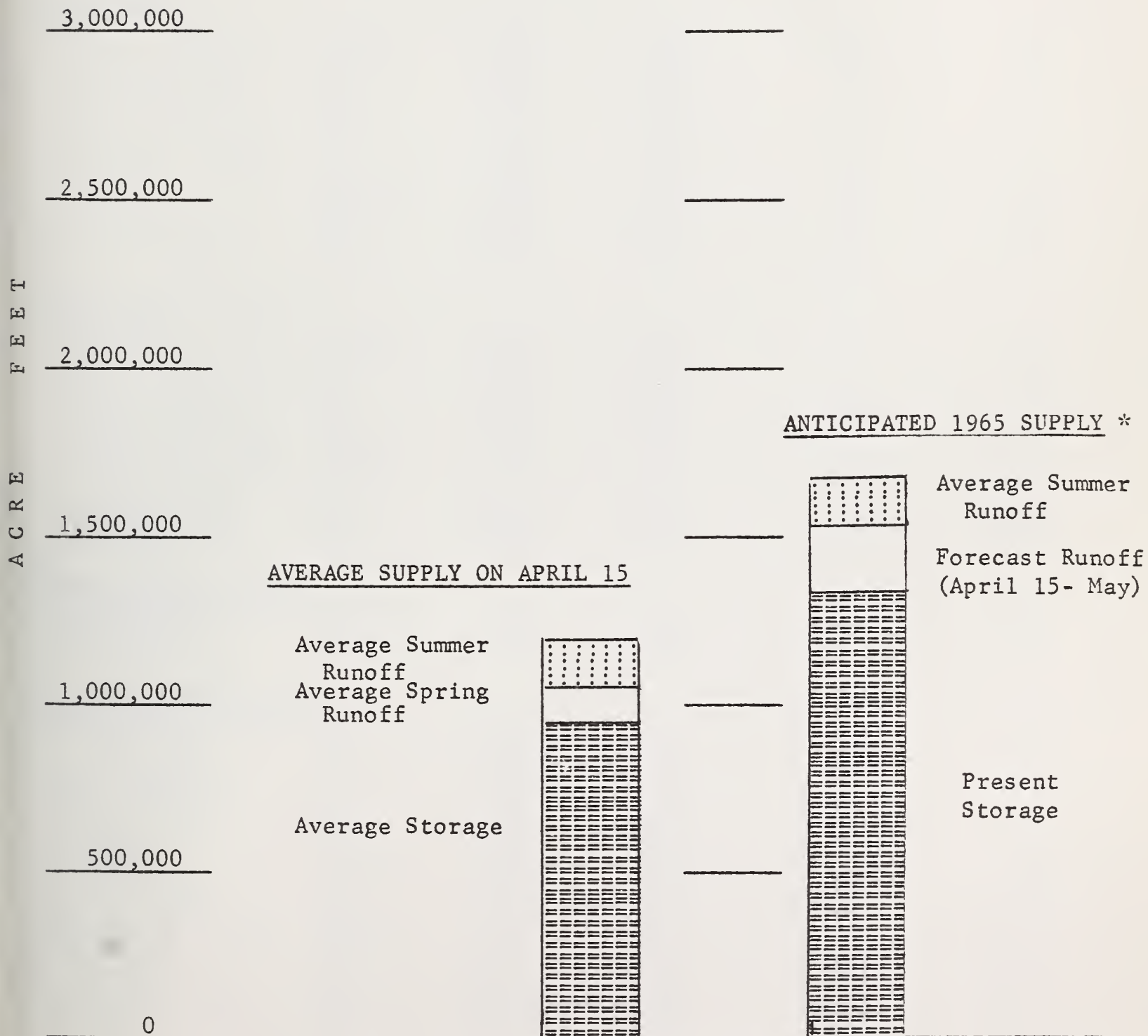
1987

1988

1989

1990

WATER SUPPLY INVENTORY
SALT RIVER VALLEY SYSTEM
APRIL 15, 1965



* Based on present Storage + Forecast Spring runoff + Average Summer runoff.



ARIZONA SNOW SURVEYS - ABOUT APRIL 15, 1965

SUB-WATERSHED and		SNOW COVER MEASUREMENTS			
SNOW COURSE		No.	Elev.	1965	
				Date of Survey	Snow Depth Water Content
<u>GILA RIVER</u>					
Beaver Head	9S6	8000	4/13	T	T
Coronado Trail	9S7	8000	4/13	T	T
Nutriososo	9S4	8500	4/13	1	0.4
<u>SALT RIVER</u>					
Beaver Head	9S6	8000	4/13	T	T
Canyon Creek #2	10R7-M	7500	4/13	15	3.6
Coronado Trail	9S7	8000	4/13	T	T
Forest Dale	10R6	6430	4/13	0	0.0
Hannagan Meadows	9S11	9090	4/13	37	13.7
Heber	10R4	7600	4/13	14	3.6
McNary	9R2-M	7200	4/13	2	0.6
Nutriososo *	9S4	8500	4/13	1	0.4
Wilson Lake	9R6	9000	4/13	42	15.3
<u>VERDE RIVER</u>					
Chalender	12P1-M	7100	4/15	11	4.0
Fort Valley	11P2	7350	4/15	12	3.4
Happy Jack	11R5	7630	4/14	14	3.8
Mormon Lake *	11R4	7350	4/14	20	6.0
Mormon Mountain	11R3-M	7500	4/14	34	10.8
Newman Park	11P5-M	6750	4/15	15	4.3
Snow Bowl #1	11P4	10260	4/14	84	29.6
Snow Bowl #2	11P6	11000	4/15	116	32.0
<u>LOWER COLORADO RIVER</u>					
Chalender *	12P1-M	7100	4/15	11	4.0
Fort Valley	11P2	7350	4/15	12	3.4
<u>LITTLE COLORADO RIVER</u>					
Canyon Creek #2	10R7-M	7500	4/13	15	3.6
Forest Dale	10R6	6430	4/13	0	0.0
Fort Valley	11P2	7350	4/15	12	3.4
Happy Jack *	11R5	7630	4/14	14	3.8
Heber	10R4	7600	4/13	14	3.6
McNary	9R2-M	7200	4/13	2	0.6
Mormon Lake	11R4	7350	4/14	20	6.0
Mormon Mountain	11R3-M	7500	4/14	34	10.8
Nutriososo	9S4	8500	4/13	1	0.4
Snow Bowl #1	11P4	10260	4/14	84	29.6
Snow Bowl #2	11P6	11000	4/15	116	32.0
Wilson Lake *	9R6	9000	4/13	42	15.3

* On Adjacent Drainage

